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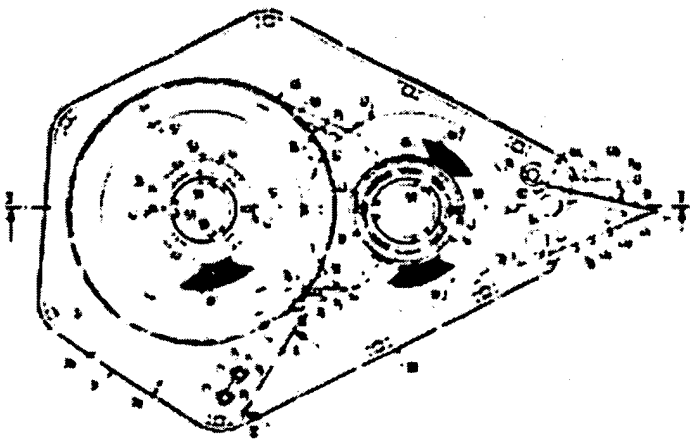
(54) Title: HAND-HELD DEVICE FOR TRANSFERRING A FILM FROM A BACKING TAPE TO A SUBSTRATE

(57) Abstract

In a manual device for transferring a film from a backing tape to a substrate, the cores of the take-up (38) and supply (36) reels are interlinked by an endless belt (50). The endless belt (50) exerts a frictional force on at least one of the two reel cores (36, 38) which is great enough to compensate for the changing winding diameter but small enough nevertheless to ensure that the take-up reel can still be driven. There are transverse grooves (75) or flutes (76) on the inside of the endless belt (50).



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Hand-held device for transferring a film from a backing tape to a substrate

A hand-held device according to the main clause of Claim 1 is known, for example, from DE-PS 36 38 722 and finds application as an office item. The film to be transferred onto the substrate can be, for example, an adhesive tape or a covering correction tape.

In this known hand-held device, the two reel cores are joined together with a gearing and a friction clutch. The friction clutch is described separately in DE-GM 88 13 861. Such an embodiment has a complicated structure, is of large size, has many components and therefore it is expensive to manufacture. Instead of a gearing with a friction clutch, the drive connection between the supply reel core and the take-up reel core can be formed by a slipping-through transmission, which has a belt or a spiral spring loop as transmission element. If one assumes that in such a design the belt or the coil spring loop is the friction clutch, then such a gear connection tends toward an irregular drive of the take-up reel core, which is to be attributed to an irregular frictional engagement between the belt and the belt running surface surrounding it. This results in a discontinuous or jump-like rotary drive of the take-up reel core, and it is influenced adversely not only because of the forming of loose loops in the backing tape to be wound up, resulting in irregular winding, but also the formation of loops on the pressure part can make the transfer of the film from the backing tape to the substrate more difficult, as a result of which the function of the hand-held device is worsened significantly. A further difficulty of this drive connection consists in the fact that, at a higher belt tension, at which a more uniform rotary drive of the take-up reel core is to be expected, the load on the pivot bearing is increased and leads to earlier wear of the bearing, which causes deterioration of the bearing, which again contributes to an irregular rotary drive.

The task of the invention is to design the hand-held device of the type described at the outset, so that the rotary drive of the gear connection is improved, specifically, is made more uniform.

In the solution according to the invention according to Claim 1, an endless belt is obtained, in which the frictional engagement with the toothless running surface of at least one of the two reel cores is improved in such a way that, in spite of a more intense frictional engagement or rotary drive and even with different peripheral velocities of the endless belt and the running surface, a more uniform frictional engagement and, therefore, more uniform slip occurs. This results in a uniform rotary drive, so that formation of loops in the region of the endless belt to be wound up can be avoided. Thus, the endless belt can be driven with low

tension, as a result of which the lifetime of the bearings of the reel cores is increased and, in addition, the hand-held device can be operated with a smaller force.

The magnitude of the transmission ratio of the slip drive according to the invention is to be chosen so that even when the supply-reel core is empty, the take-up reel core is driven at least according to the backing tape velocity in order to avoid fluttering of the backing tape section to be wound up.

For this reason, with the reel core diameters being preferably the same size, the diameter of the transport disk of the supply-reel core must be made correspondingly larger than the diameter of the transport disk for the endless belt belonging to the take-up reel core.

It was found that a larger belt wrap of the endless belt has a favorable effect for obtaining a frictional engagement which is as free from jumps as possible. Therefore, it is advantageous to allow frictional engagement only between the endless belt and the larger transport disk.

With regard to the solution according to the invention, it should be pointed out that a hand-held device is already known according to US-Patent 4,112,536 in which the pressing part is formed by a roller, over which the backing tape is guided. The roller is connected to the take-up reel core with a belt drive. The equalization between the speed with which the backing tape is rolled over the pressure roller and the speed with which it is rolled up is done with the aid of a knob that is accessible from the outside, which sits on the axis of the take-up reel core. In this known embodiment, although again a frictional device can be provided, there is no conclusion as to where such a frictional device, formed optionally by a friction clutch, could be provided.

The advantages according to the invention are also possible alternatively by arranging the transverse grooves or flutes in the form of toothed bodies on the running surface or on the transport disk of one or both reel cores. In the case of such a design, the inside surface of the endless belt is to be designed without transverse grooves or flutes.

The desired frictional slip can advantageously be achieved with an endless belt which cannot be extended. However, it was shown that one can also use an endless belt which can be elastically elongated in the longitudinal direction. The endless belt can be formed by a coil spring which is made of metal, preferably from spring metal. An endless belt made of rubber or plastic can also be used.

The endless belt is preferably guided over the periphery of the transport disks, whereby each reel core is connected to a transport disk, preferably in a separable manner. The transport disks may have a groove extending over their periphery to hold the endless belt. In order to achieve the desired frictional engagement, it is advantageous when that part of the periphery, that runs on the endless belt, to be roughened or has a transverse scoring or toothing, on at least one of the transport disks.

A possible practical example of the invention can consist of the fact that the drive of the endless belt forming a speed transmission from the supply-reel core to the take-up reel core. This can be realized by the fact that the transport disk attached to the supply-reel core for the endless belt has a larger diameter than the transport disk attached to the take-up reel core. In order to provide lateral support to the backing tape to be wound off and then the used carrier tape to be wound up again, it is furthermore proposed that a supporting disk be located between the take-up reel core and the transport disk attached to it, the diameter of the supporting disk being greater than or equal to the largest winding diameter of the used backing tape and that the transport disk attached to the supply-reel core have a diameter which is larger than or equal to the largest winding diameter of the supply reel.

Since the reel cores are parts which must be replaced after the back-up tape is used up, filling the reel cores with unused backing tape, it is advantageous to provide separable coupling attachments between the reel cores and the transport disks assigned to them, so that only the reel cores would have to be replaced. By contrast, the transport disks can remain in the housing. This leads to a significant savings in cost.

The present hand-held device should be easy to handle. Thus, it should not only be handy and held conveniently in the hand, but it is also desirable that it should be clear in the region of its pressing parts, so that the film can be applied more easily and accurately. It is also advantageous to make the housing of the manual device in the region of the part where it is pressed as small as possible, which contributes to clarity in the region of the pressing part. The design of a front region that is as small as possible can be achieved by arranging the take-up reel core between the pressure part and the supply-reel core. This is achieved by assigning the smaller transport disk to the take-up reel core, in order that, even when the supply reel is unwound and the take-up reel is filled, the required rotary speed for the take-up reel core is achieved. In this case, a wedge-shaped housing and a wedge-shaped backing tape guide is advantageous, spread so with that the take-up reel core can be arranged between the backing tape sections running around the pressure part.

Preferred embodiments of the invention will now be explained with the aid of a drawing. The following are shown:

Figure 1 Inside view of a hand-held device with the lid removed;
Figure 2 A supply-reel core with transport disk and supply winding;
Figure 3 A take-up reel core with transport disk and supporting disk
Figure 4 An inside view of a hand-held device in a modified embodiment with the cover removed;
Figure 5a Section V-V through the hand-held device which is adjusted for the transfer of a wide tape;
Figure 5b Section V-V through a modified hand-held device which is adjusted for transferring a narrow tape;
Figure 6 Partial section VI-VI in Figure 4 in a somewhat enlarged representation;
Figure 7 A schematic view corresponding to Figure 4 of a modified drive connection between the supply-reel core and the take-up reel core.

The hand-held device shown in Figure 1 has a housing 1 which consists of a lower part 2 and a removed cover part which is not shown. The lower part 2 consists of a base plate and a side wall which goes around but is interrupted in one position. The side wall has thickenings 3 which have holes 4. These holes 4 serve the purpose of accepting the connecting pins provided on the cover part (not shown).

Stud axle 5 and 6 as well as guide pins 9 and 10 protrude upward from the bottom wall of lower part 2. In addition, a pressure part 7 is attached to the bottom wall, and this protrudes through an opening 17 in the side wall and has a pressure tip 8.

The stud axle 5 extends through a central opening 15 in a supply-reel core 11, on which a supply winding 16 sits. Furthermore, a transport disk 12 is located on the supply-reel core 11 which is provided with a groove 13 that runs around the periphery. The groove has a transverse toothing or fluting 14 on the inside. In Figure 1, the transport disk 12 is on the bottom, that is, behind supply winding 16.

Stud axle 6 extends through a central opening 20 in a take-up reel core 19. This is connected to a transport disk 21 which is provided with a groove 22 on its periphery. Groove 22

has a transverse toothing or fluting 23. A supporting disk 24 is located between the take-up reel part 19 and the transport disk 21.

An endless coil spring 18 runs over the two transport disks 12 and 21, and this spring is elastically expandable in the longitudinal direction. The coil spring is made of spring steel.

The backing tape 26 that carries an adhesive or correction layer is removed from the supply winding 16 and runs over a guide pin 9, through the rounded tip of the pressure part 8 as well as over guide pin 10 onto the winding on the take-up reel core 19 of the used backing tape 25. When the hand-held device is pressed with tip 8 of the pressure part 7 onto a substrate and is moved over the substrate, the adhesive or correction layer located on the outside of the backing tape 26 is transferred to the substrate. Due to the friction that is produced at the transfer point, the backing tape 26 is removed from supply winding 16. Supply winding 16 turns supply reel core 11. Through the transport disk 12 and the coil spring forming the endless belt 18, supply reel core 11 drives transport disk 21, which is connected to take-up reel core 19. The winding 25 of the used backing tape 26 is located on the latter. The used backing tape is wound onto this winding 25 as a result of the drive outlined above.

Since during use of the hand-held device, the diameter of the supply winding 16 becomes smaller and the diameter of the winding 25 of the used backing tape becomes larger, it is necessary that the peripheral velocity of winding 25 be gradually reduced and the peripheral velocity of winding 16 be gradually increased. In order to take this into account and in order to avoid looseness of the backing tape 26 to be wound up, it is necessary that the endless belt 18 have a certain frictional slip on transport disks 12 and 21. A slackness in the used backing tape 26 to be wound up can be avoided by providing a transmission between the transport disk connected to the take-up reel core 19 and of the transport disk 12 connected to supply reel core 11. This is achieved by making the diameter of transport disk 12 greater than the diameter of transport disk 21.

In the design according to Figure 4 and 5a as well as 5b, the housing again consists of two bowl-shaped housing parts put against one another, namely a lower part 31 with a base plate 31a as well as a side wall 31b standing up on its periphery and an upper part 32 with a cover wall 32a and a side wall 32b pointing downward from the peripheral edge of the latter. In the assembled state of the housing, the free edges of side walls 31b, 32b lie on each other, where, in a reverse way to that shown in the first practical example, connecting pins 33 protrude upward

from the inner wall of side wall 31b, and the holes 34 in the inside thickenings 35 of the upper side wall 32b are included with positive locking or by clamping.

In this embodiment, too, the supply reel core 36 with its transport disk 37, the take-up reel core 38 with its transport disk 39 and the pressure part 41 are held by positive locking between the lower part 31 and the upper part 32. In this embodiment, the transport disks 37, 39 are separate components and are attached through a rotary drive connection to the corresponding reel cores 36, 38. For this purpose, one or two diametrically opposite catching pins 42, 43 are provided, which fit in catching holes 44, 45 of the other part. Preferably, the catching pins 42, 43 are formed in an axis-parallel arrangement to the transport disks 37, 39 in one piece and the catching holes 44, 45 are preferably long holes which are curved in the peripheral direction in an arc-like manner around the corresponding rotary axis, so that there is always movement play in the peripheral direction is assigned to the rotary drive connections. This movement play depends on the length of the long holes.

The transport disks 37, 38 are always formed from a supporting disk 46, 47 with hub parts 48, 49 extending downward to base plate 31a, where the transport disk 37, which has a larger active diameter, has a hollow cylindrical coaxial drive ring 51 on its bottom part, which has an outer diameter which is a few millimeters smaller than the diameter of the supporting disk 46 carrying it. As a result of this the endless drive belt 50, which is shown only in Figures 4 and 5b and runs on drive ring 51 and hub part 49 receives a sideways guidance between the supporting disk 46 and the base plate 31a. Such guidance is also received by the endless belt consisting of an almost non-extendable or inelastic material, especially a plastic, between supporting disk 47 and base plate 31a. The supporting disks 46, 47 overlap one another on the sides facing each other. In order to be able to arrange, in spite of this, that the protecting surfaces facing reel cores 36, 38 be arranged in one plane, the larger transport disk 37 is crimped at right angles at its outer peripheral region in such a way that when arranging the supporting disks 46, 47 in a plane of the crimped part 52, supporting disk 46 grips supporting disk 47 underneath.

The transport disks 37, 39 and the reel cores 36, 38 are always on a stud axle bearing 53, 54 held rotatably, and these studs preferably have such a length that the cover wall 32a is supported on them. Preferably, on the inside of cover wall 32a, stop rings 55 are made in one piece, adjusted in size to the diameter of the stud hole axles 53, 54, the rings extending to the free edge of the corresponding stud hole axles 53, 54. For axial limitation of the reel cores 36, 38 and of the windings W1, W2 located on them, shown only in Figure 4, preferably three pairs of reinforcing ribs 57, 58 are used, each formed on the inside of the cover wall 32a and extending

downward to the reel cores 36, 38, as well as arranged radially with respect to the corresponding reel axis; and these provide a sideways guiding function for the reel cores 36, 38 as well as for the windings W1 and W2 and at the same time stabilize the cover wall 32a. Preferably, the total number of six supporting ribs 57, 58 are arranged so that one reinforcing rib 57, 58 always points to the pressure part 41 (see Figure 4).

For axial attachment of transport disks 37, 39 on the corresponding stud hole axles, 53, 54, a locking device with locking arms 59 and locking catches 61 is provided in each case and when the transport disks 37, 39 are placed on these, they bend inwards elastically and lock behind the locking edges of transport disks 37, 39 in their functional position. There are always three locking arms 59 provided which are distributed over the periphery in an axis-parallel manner, and these arms are formed by axis-parallel cuts 62 in stud hole axles 53, 54, which extend from their free to a point just shortly before the base plate 31a. The locking catches 61 are arranged outside on the free ends of the locking arms 59 and are formed by rounded beads, which grip behind the supporting disks 46, 47, preferably in the annular recess 63. When the transport disks 37, 39 are pulled off from the stud hole axles 53, 54, the locking arms 59 can be pushed through by applying a certain force.

The pressure part 41 is connected to the lower part 3a and the upper part 32 in each case with two joins at a distance from one another. For this purpose, the pressure part 41, in the region of a holding body 64 arranged in the housing, has on its upper and lower side two round beads 65 or bores 66 which engage into the adapted recesses 67 or adapted pegs on the inside of the base plate 31a and of the cover plate 32a, or grip over them.

As already shown in the practical example according to Figures 1 to 3, the pressure part 41 is a compact, small component which penetrates through the housing wall and is supported on the sides by two supporting cheeks 71 arranged on its sides, of which one is adapted to the two sides of the separating groove 72 of the housing at the lower part 31 and the other is adapted in one part on the upper part 32. The supporting cheeks 71 have such a size that they protrude to above and below the pressure part 41 – in the position in which it is used according to Figures 4 and 7. Guide channels 71a, 71b are thereby created for the endless belt 50. Looking from the side, in the use position, the pressure part 41 has the shape of a forward-directed wedge, the tip of which is designated with 72, and which protrudes beyond the supporting cheeks 71 by a few millimeters, preferably by about 5 mm. The front face 41a and the back face 41b of pressure part 41 are essentially plane surfaces, which are directed essentially tangentially or secantially to the radial angle regions of the take-up reel core 38. The front face 41a of pressure part 41 is

displaced with respect to the outside 60 of the housing assigned to it, which is the bottom side in the use position, only by a few millimeters towards the inside. As a result of this, the protecting cheeks 71 of pressure part 41 protrude only slightly in the downward direction. In the front face 41a, a transversely running recess, especially a rounded trough 41c is provided in the area in which the pressure part 41 protrudes beyond the supporting cheeks 71. The trough 41c runs in the rounded tip 72 of the pressure part or ends near it. As a result of this, a guided application can be achieved. In order to save weight and material, the pressure part 41 – in the view according to Figure 4 – has a preferably triangular recess so that the pressure part 41 takes the form of a triangular frame.

As in the case of the first practical example, in this practical example it is also advantageous to roughen the cylindrical peripheral surface of the catch part 49 and of the drive ring 51 or to provide them with axis-parallel teeth so that the endless belt is able to transfer the required force. However, good function is also provided in the case of cylindrical running surfaces or peripheral surfaces.

In the embodiment according to Figures 4, 5a and 5b, a reversing lock 74 is provided for the transport disk 37 for the supply reel core 36. This is a ratchet lock 75 which extends in the plane of supporting disk 46 secantially to this and with its free end is slightly pre-stressed against the periphery of supporting disk 46. Because of the secantial arrangement, the supporting disk 46, which is provided with teeth 26 on its periphery, can only turn in its unrolling direction. The rotation in the opposite direction is locked by the ratchet lock arm 75.

The ratchet lock arm 75 is held with positive locking on the lower part 31 or on its base plate 31a. For this purpose, there are two round pegs 77 which extend parallel to one another and are at a distance from one another transversely to the ratchet lock arm 75 and can be inserted into two adapted holes in base plate 31a. The holes 78 are provided in material projections 79 above base plate 31a.

The functional details during the application of the backing tape, which is provided with a coating on its under side, onto the substrate not shown here, correspond essentially to that of the first practical example.

The two embodiments according to Figures 5a and 5b are the same in principle. There is only one difference, and that with regard to the guide widths for the reel cores 36, 38 and the pressure part 41, where the bottom parts 31 and the mutually comparable transport disks 37, 39

are the same. Preferably, the lengths of the stud hole axles 53, 54 and the lengths of the stop rings 55 are also the same. Different, on the other hand, are the lengths of the supporting ribs 57, 58 and the depths of the collar part 71a which in the embodiment according to Figure 5b are longer by the thickness difference of the tape or of the reel cores 36, 38 than in the case of the embodiment according to Figure 5a.

In order to realize the two hand-held devices for backing tapes of two different widths, one merely requires two different upper parts 32, reel cores 36, 38 and pressure parts 41. On the other hand, lower part 31 and the transport disks 37, 39 are the same.

It is also possible to provide a corresponding design for several, for example three or four, backing tape widths, where the number of the different parts, namely upper part 31, reel cores 36, 38 and pressure parts 41 correspond to the number of widths.

In Figures 4 and 5b a preferred embodiment of the endless belt 50 or transfer belt is shown. We are dealing here with a preferably flat endless belt, made of plastic of lowest possible expansion, which is rectangular or square in cross-section. The endless belt 50 is flexible or bendable and therefore it can loop around the reel cores 36, 38. he minimum possible expandability of the endless belt 50 is advantageous because otherwise, namely in case of elastic expandability, an irregular drive of the take-up reel core 38 core occurs, especially in case of sudden pulling off of the winding, because in this case it skips. The minimum possible or limited expandability can, however, only be achieved if the tape is thick. However, such thickness works against the bendability for the purpose of looping.

In order to overcome these difficulties, the endless belt 50 has narrow square grooves 75 on its inside always at a uniform distance from one another, the depth of which corresponds approximately to half the thickness of the endless belt, and the base of the grooves is preferably rounded. Flutes 76 are formed between the transverse grooves 75, which press on the peripheral surfaces of reel cores 36, 38.

In the case of the endless belt 50 according to the invention, the expandability essentially is kept as low as possible in spite of the narrow transverse grooves 75. The rotary drive is improved by greater friction between the reel cores 36, 38 and the flutes 76.

In both embodiments described above, the take-up reel core 38 is arranged between the pressure part 41 and the supply reel core 36. This is advantageous because – in order to be able

to drive the take-up reel core 38 even when the supply reel core 36 is empty, and to do this in a reliably functioning way corresponding to the speed of the endless belt – the drive ring 51 must have a correspondingly larger diameter and a size larger than the supporting disk 47 of the take-up reel core 38. As a result of this, the smaller part, namely the take-up reel core transport disk 39, is arranged in the front, and therefore the height of the housing can be smaller in the front, as a result of which the clarity and handling during application is improved. The arrangement is made in such a way that – when the hand-held device is in the use position – the endless belt extends from the bottom side of the supply reel core 36 below the take-up reel core 38 and of the pressure part 41 to its tip 72 and then above pressure part 41 to the top side of the take-up reel core 38.

In the embodiment according to Figures 4 and 5, no guide pin 9 according to the first practical example is provided for the winding section W3 extending to the pressure part 41. This running-down winding section W3 extends directly to pressure part 41, the corner 78 of which facing it is rounded. When the take-up reel core 38 is almost full and the wind-off reel core 36 is almost empty, the down-running winding section W3 glides with its inner uncoated surface side on winding W2 of the take-up reel core 38, where it is guided on the side between the supporting disk 47 and the reinforcing ribs 58.

In order to guide the winding section W4 that is running from pressure part 41 onto the take-up reel core 38, a guide peg 79 is arranged inside of the pressure part 41 extending up from the base plate 31a, and the inside of this is flush with the back surface 81 of pressure part 41. This prevents the winding section W4 from lifting off form back surface 41b when the take-up reel core 38 is full. In order to prevent buckling off of the winding section W4 especially in the case of empty take-up reel core 38, the corner 82 of the pressure part 41 facing it is rounded off.

In the embodiment according to Figure 7, the smaller transport disk 39 of the take-up reel core 38 is provided with teeth 81 like a toothed wheel, the shape and size of which are adjusted to the cross-sectional shape of the transverse groove 71 of the endless belt 50. Preferably, the arrangement is made so that the bearing surfaces of flutes 76 between teeth piece 81 lie on the peripheral surface of the hub part 49. In this embodiment, slip of this drive connection takes place only between the endless belt 50 and the larger transport disk 31 or the supply reel core 36. This was found to be very favorable with regard to jump-free slip and continuous drive or winding of the endless belt 50 onto the supply reel core 38, where a belt wrap as large as possible is highly effective. Preferably, additionally a deflection roller 82 can be supported freely rotatably on a bearing journal 83, which adjusts the first trunk of the endless belt, preferably – in

the use position – of the lower trunk in such a way that the belt wrap or belt wraps can be increased. Preferably this is not a tension roller but only a stationary deflecting roller 82. The bearing journals 83 for the deflecting roller 82 are arranged in the lower housing part 31, preferably formed in one part with it.

The essentially non-extendable endless belt 50 should be made of such length, in consideration of the axial distances and running surface diameters, that it runs with a low belt tension.

Claims

1. Hand-held device for transferring a film from a backing tape (26) onto a substrate, in which, in a housing, a supply reel core (11, 36) for a supply winding (16, W1) of the backing tape (26) and a take-up reel core (19, 38) for a winding (25, W2) of the used backing tape (26) are arranged and the backing tape (26) pulled off from the supply winding (16) is guided to the take-up reel core (19, 38) through a pressure part (7, 41) outside the housing, in which the take-up reel core (19, 38) is driven by the supply reel core (11, 36) with equalization of the changing winding diameter, and in which the take-up reel core (19, 38) and the supply reel core (11, 36) are connected to one another by an endless belt (18, 50) looping through running surfaces, characterized by the fact that the endless belt (18, 50) has a frictional slip with respect to the toothless running surface of at least one of the two reel cores (11, 19, 36, 38) which, on the one hand, is large enough to compensate for the changing winding diameter and on the other hand is small enough that nevertheless the drive of the take-up reel core (19, 38) is ensured and that transverse grooves (75) or flutes (76) are arranged on the inside of the endless belt (18, 50).

2. Hand-held device according to the main clause of Claim 1, characterized by the fact that the endless belt has a frictional slip on its toothless or essentially smooth running surface against the running surface of at least one of the two reel cores, this frictional slip being on the one hand large enough to compensate for the changing winding diameter and on the other hand small enough that nevertheless in spite of the drive of the take-up reel core (19, 38) is ensured and that in or on the running surface of one or both reel cores transversely running transverse grooves or transverse scoring or flutes are arranged.

3. Hand-held device according to Claim 1 or 2, characterized by the fact that the endless belt (18, 50) is formed by a flat belt.

4. Hand-held device according to one or several of Claims 1 to 3, characterized by the fact that the flexible or bendable endless belt (50) has little or no extension in its longitudinal direction.

5. Hand-held device according to one or several of the previous claims, characterized by the fact that the transverse grooves or flutes are arranged at the same distances from one another.

6. Hand-held device according to one or several of the previous claims, characterized by the fact that the base of the intermediate spaces between the flutes or transverse grooves (75) is rounded, and preferably a U-shaped or semicircular-shaped cross-section is provided for the intermediate spaces or the transverse grooves (75).

7. Hand-held device according to one or several of the previous claims, characterized by the fact that the endless belt (18) is made of rubber or plastic.

8. Hand-held device according to one or several of Claims 4 to 7, characterized by the fact that the periphery of the endless belt (50) is dimensioned so that it exhibits its normal belt tension in a position when it is placed on the transport disks (37, 39) with a straight extending upper trunk and lower trunk.

9. Hand-held device according to one or several of the previous claims, characterized by the fact that the periphery of the endless belt (50) is dimensioned so that in its position when it is placed on the transport disk (37, 39) at least one of its trunks can be bent in without exceeding a normal belt tension, and that one deflecting roller (82) is provided around which the trunk is moved around in the bent position.

10. Hand-held device according to one or several of the previous claims, characterized by the fact that the running surface of one or both reel cores (36, 38), preferably the running surface assigned to the take-up reel core (38), has transverse grooves or flutes (81) or teeth which correspond to the flutes (76) or transverse grooves (75) of the endless belt (50).

11. Hand-held device according to one or several of the previous claims, characterized by the fact that the endless belt (18), formed especially by a coil spring, is elastically extendable in its longitudinal direction and is preferably made of metal, such as spring metal.

12. Hand-held device according to the main clause of Claim 1, or according to one or several of the previous claims, characterized by the fact that the housing is preferably dividable by a dividing joint running especially transversely to the axes of the reel cores (36, 38) and that two transport disks (37, 39) with running surfaces for the endless belt (50) are provided and that the reel cores (36, 38) with the corresponding transport disks (37, 39) are each connected through a preferably axially separable rotary drive connection.

13. Hand-held device according to Claim 2, characterized by the fact that the rotary drive connection has one or two diametrically opposed axis-parallel rotary drive pins (42, 43) on one part which engage in catching holes (45) in the other part.

14. Hand-held device according to Claim 13, characterized by the fact that catching holes (44, 45) are long holes curved in a circular arc shape.

15. Hand-held device according to Claim 14, characterized by the fact that the reel cores (36, 38) are each formed by an outer and an inner ring which are connected to one another through radial bridges, preferably four bridges.

16. Hand-held device according to one or several of the previous claims, characterized by the fact that transport disks (37, 39) each consist of a flange-shaped supporting disk (46, 47) and a hub part (48, 49) formed on it on one side.

17. Hand-held device according to Claim 16, characterized by the fact that the transport disk (37) for the supply reel core (36) is located on the side on which its hub part (48) is located, and has a drive ring (51) formed in one piece with it, the diameter of which is a few millimeters smaller than the outside diameter of the supporting disk (46).

18. Hand-held device according to one or several of the previous claims, characterized by the fact that the axial distance of the transport disks (37 39) from one another is dimensioned somewhat smaller than the sum of their radii, so that the transport disks (37, 39) overlap one another, so that the transport disk (37) of the supply reel core (36) is crimped at right angles in its edge region so that the crimping grips under the supporting disk (47) of the transport disk (39) of the take-up reel core (38) and the supporting disks (46, 67) are arranged in one plane.

19. Hand-held device according to one or several of the previous claims, characterized by the fact that transport disks (12, 21) have a groove (13, 23) that extends over their periphery to hold the endless belt (18).

20. Hand-held device according to one or several of the previous claims, characterized by the fact that the running surface of at least one of the transport disks (12, 21, 37, 39) is roughened.

21. Hand-held device according to one or several of the previous claims, characterized by the fact that the endless belt drive forms a speed transmission from the supply reel core (11, 36) to the take-up reel core (19, 38).

22. Hand-held device according to one or several of the previous claims, characterized by the fact that the transport disk (12, 37) for the endless belt (18) which is joined with the supply reel core (11, 36) has a greater diameter than the transport disk (21, 39), which is joined to the take-up reel core (19, 38).

23. Hand-held device according to Claim 22, characterized by the fact that a supporting disk (24, 27) is located between the take-up reel core (19, 38) and the transport disk (21, 39) connected to this, and the diameter of the supporting disk is greater than or equal to the largest winding diameter of the used backing tape, and that the transport disk (12, 13) connected to the supply reel core (11, 36) has a diameter which is greater than or equal to the largest winding diameter of the supply winding (16).

24. Hand-held device according to one or several of the previous claims, characterized by the fact that the housing consists of a lower part and upper part (31, 32) and the transport disks (37, 39) with the corresponding reel cores (36, 38) are supported with small axial movement play between the lower part (31) and the upper part (32) or the components thereof.

25. Hand-held device according to one or several of the previous claims, characterized by the fact that the reel cores (11, 19, 36, 38) are arranged on the sides of the transport disks (12, 21, 37, 39) which face the upper part (32).

26. Hand-held device according to Claim 24 or 25, characterized by the fact that for the pivot bearing of the transport disks (12, 21, 37, 39) and reel cores (11, 19, 36, 38), preferably hollow cylindrical stud axles (5, 6; 53, 54) are provided which preferably extend to the wall of the cover (32a).

27. Hand-held device according to Claim 26, characterized by the fact that preferably annular catches (55, 56) are formed particularly in one piece with the cover wall (32a) coaxially to the stud axles (53 54) and that the stud axles (53, 54) extend all the way to the catches (55, 56).

28. Hand-held device according to one or several of the previous claims, characterized by the fact that the transport disks (37, 39) are attached on the stud axles (53, 54) axially using locking devices with locking catches (61).

29. Hand-held device according to Claim 28, characterized by the fact that the snap-in locking devices are each formed by one or several, preferably three, locking arms (59) arranged distributed on the periphery with radially outward arranged locking catches (61) on their free ends, the locking catches being formed by axis-parallel cuts (62) in the hollow cylindrical stud axles (53, 54).

30. Hand-held device according to one or several of the previous claims, characterized by the fact that one of the two transport disks (37, 39) or supporting disks (46, 47) preferably the supporting disk (46) of the supply reel core (36) has a toothing (76) on its periphery, which cooperates with a ratchet lock arm (75) forming a reversing lock.

31. Hand-held device according to Claim 3 [sic, should be 30?], characterized by the fact that the ratchet lock (75), which preferably extends in the plane of the supporting disk (46) and secantially to it, is inserted with the aid of two pegs (77) extending from it transversely into peg holes (78) of the lower part (36), these holes being located on the catches (79) formed on the base plate (31a).

32. Hand-held device according to one or several of the previous claims, characterized by the fact that the pressure part (7, 41) is connected with positive locking to the bottom part (2, 31) and to the upper part (32) with the aid of two peg connections arranged on both sides.

33. Hand-held device according to one or several of the previous claims, characterized by the fact that, in order to adapt the hand-held device to at least two backing tapes of different widths, always at least two supply reel cores (36), take-up reel cores (38) and pressure parts (41) with different widths corresponding to the width difference, as well as at least two upper parts are provided, in which the reel cores (36, 38) and the pressure part (41) of the bordering parts have a size directed to the lower part (31) corresponding to the width difference.

34. Hand-held device according to the main clause of Claim 1 or according to one or several of the previous claims, characterized by the fact that the transport disk (21, 9) of the take-up reel core (19, 38) has a smaller diameter than that of the transport disk (12, 37) of the

supply reel core (11, 36) and the take-up reel core (19, 38) with its transport disk (12, 39) is arranged between the supply reel core (11, 36) and the pressure part (7, 41) and the housing narrows toward the pressure part (41) in a tear-drop-shape, preferably in a wedge shape to a degree that specifically is only slightly larger than the corresponding dimension of the pressure part (41).

35. Hand-held device according to one or several of the previous claims, characterized by the fact that the pressure part (41) is arranged in the region between the take-up reel core (19, 38) or its supporting disk and the housing opening through which the pressure part (41) penetrates and is preferably secured separably.

36. Hand-held device according to one or several of the previous claims, characterized by the fact that supporting cheeks (71) are formed in one part with the housing on both sides of the pressure part on the bottom part (31) and upper part (32) and that the pressure part (41) protrudes beyond the supporting cheeks (71), preferably only by a few millimeters.

37. Hand-held device according to one or several of the previous claims, characterized by the fact that the pressure part (41) – viewed along the reel core (36, 38) – has essentially a wedge-like shape, the apex-shaped tip of which is rounded and that the preferably plane front and back surfaces of the pressure part (41) are essentially directed tangentially or secantially to the winding (W2) of the take-up reel core (19, 38).

38. Hand-held device according to one or several of the previous claims, characterized by the fact that the pressure part (41) has on its bottom side a grooving or transverse recess, running out in the rounding of its tip (72) or slightly before, especially a rounded transverse trough (41c).

39. Hand-held device according to one or several of the previous claims, characterized by the fact that the width of the pressure part (41), which is only slightly wider than the width of the backing tape, diverges before the housing or the side cheeks (71) toward the tip (72).

FIG. 2

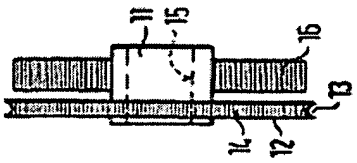

FIG. 1

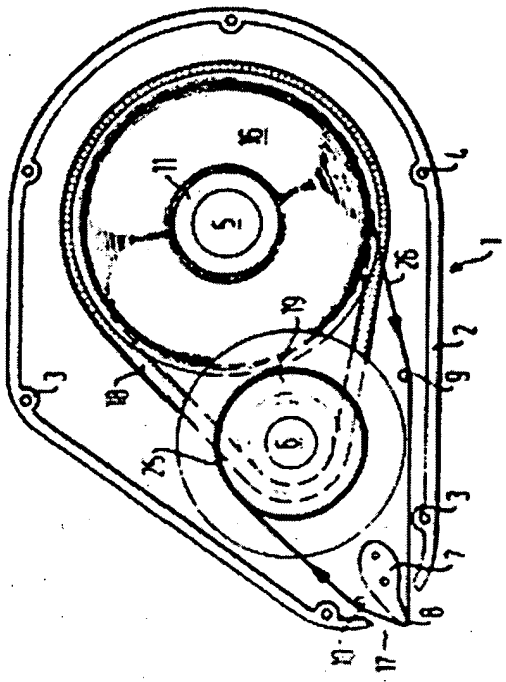

FIG. 3

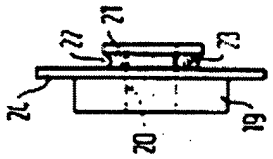

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FIG. 4

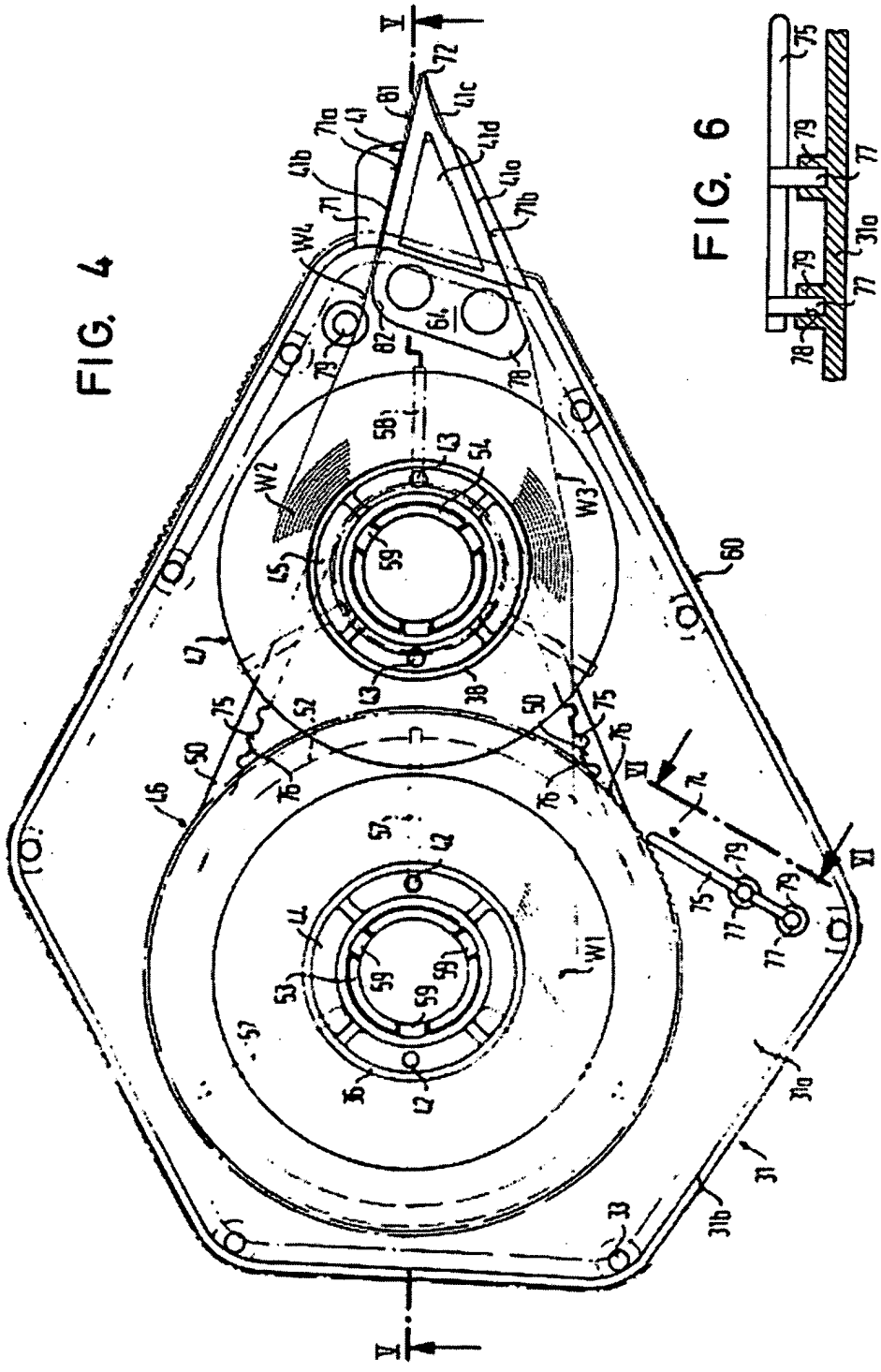

FIG. 6

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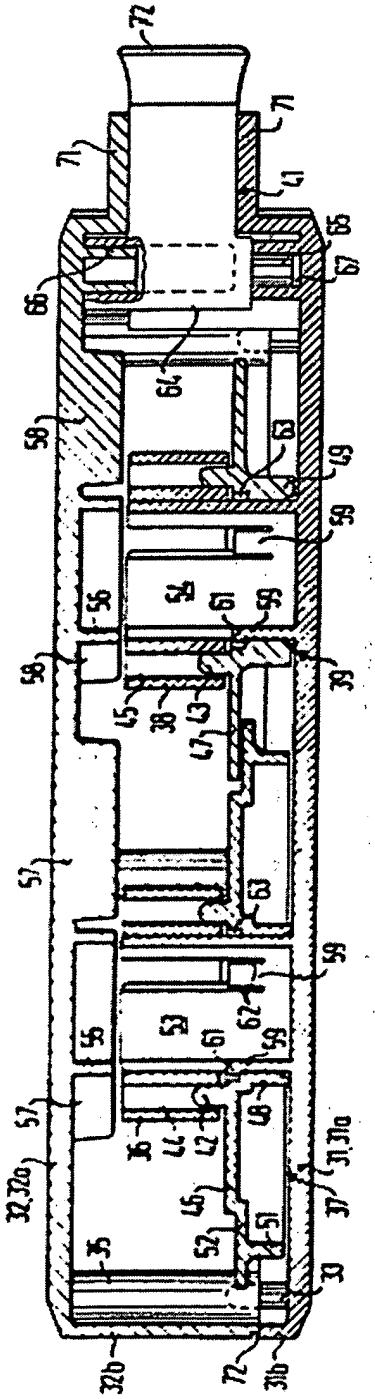

FIG. 5a

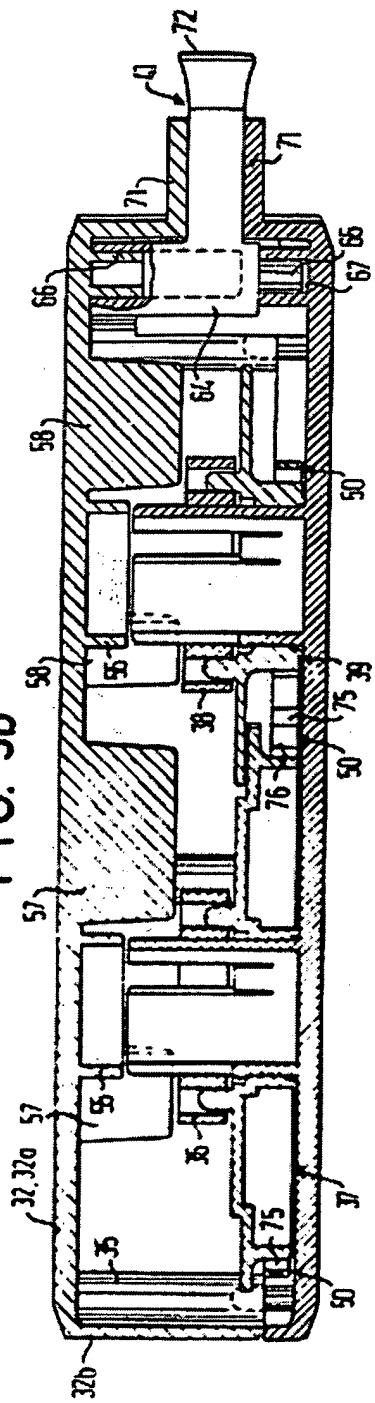

FIG. 5b

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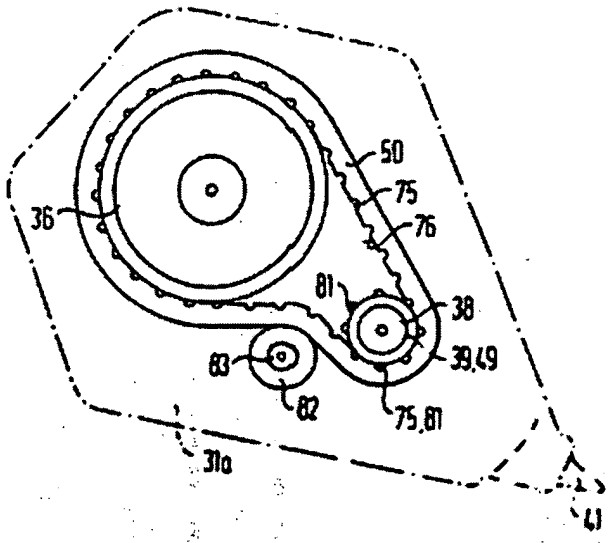
FIG. 7



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INTERNATIONAL SEARCH REPORT

International Application No PCT/EP 91/00758

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl.[5] B65H37/00

II. FIELDS SEARCHED

Minimum Documentation Searched

Classification System	Classification Symbols
Int. Cl.[5]	B65H; F16H

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched

III. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
A	DE, C, 3 638 722 (PELIKAN AG) (cited in the application) see column 11, line 67 - column 12, line 41; figures 2,3 ---	1,21,22
A	US, A, 2 909 301 (FRITZINGER G.H.) 20 October 1959 see column 2, line 48 - column 3, line 60; figures 1,2 ---	1,21,22
A	DE, B, 1 112 362 (WILHELM HERM. MULLER & CO. K.G.) 3 August 1961 see the whole document ---	1-10
A	DE, C, 902 552 (HENKEL KGAA) 26 April 1990 see column 5, line 33 - column 6, line 24; figures 4,8-13 ---	1,12,22-24, 30,31

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
14 August 1991 (14.08.91)	10 September 1991 (10.09.91)

International Searching Authority	Signature of Authorized Officer
European Patent Office	

Form PCT/ISA/210 (second sheet) January 1985

International Application No. PCT/EP 91/00758

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

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A	DE, A, 2 014 537 (RCA CORP.) 15 October 1970 see page 1 - page 2, line 19; figures	1-10

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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

EP 9100758
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on
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14/08/91

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